



(19)

Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 1 040 760 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
04.10.2000 Bulletin 2000/40

(51) Int Cl.7: A23D 7/00

(21) Application number: 99201414.2

(22) Date of filing: 05.05.1999

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: 31.03.1999 US 282850

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(54) Soft coating for ice confectionery

(57) A water-containing soft creamy composition for, particularly, coating, or enrobing, ice confectionery products is prepared by forming an emulsion of cream

and milk solids with a vegetable oil and butter fat and an emulsifier system and mixing melted chocolate into the emulsion, and the composition may be used to form a layer or inclusion in an ice confectionery product.

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Description**Field of the invention**

[0001] The present invention relates to a water-containing soft creamy coating and its applications as internal and external substitute for conventional fat-based coating in ice confectionery products. It further relates to a method of coating ice confectionery.

Background of the invention

[0002] In a conventional fat-coated ice cream product, for example an ice lolly, bar, morsel, cone, cup or cake, the fat may account for some 45-60% by weight of the coating. In ice cream products with conventional fat-based coatings, the fat gives some brittleness to the coating and the coating does not properly adhere to the ice confectionery core.

[0003] Thus, it would be desirable to provide a coating composition which has a soft texture, a good adhesion on ice and good storage and heat-shock resistance, a good chocolate flavor and which is able to be processed in a conventional coating operation.

[0004] In US-A-5,556,659 there is claimed a process for coating a frozen confectionery product in which the coating composition is calorie reduced in that it is in the form of a water-in-oil emulsion, wherein the emulsion comprises 40 to 55 % by weight water, 2 to 4 % by weight of an emulsifier system comprising decaglycerine decacoleate, and less than about 3 % by weight water-soluble compounds. This coating was designed to reduce the calorie while keeping the crispness/brittleness.

[0005] In US-A-5,120,566 there is disclosed a composition for enrobing ice confectionery based on a water-in-oil emulsion, in which the emulsifier system is a low hydrophilic lipophilic balance sugar fatty ester and which contains a nut paste.

Summary of the invention

[0006] We have found that it is possible to produce a soft coating, by incorporating a water-in-oil emulsion into conventional chocolate or product similar to chocolate (the term chocolate will be employed hereinafter to designate chocolate and products similar thereto), which has the texture and flavor properties superior than conventional fat-based coatings and significantly better keeping properties, creaminess, softness, e.g. less brittleness and better adhesion to ice confectionery.

[0007] Accordingly, the present invention provides a coating for ice confectionery products, which comprises by weight,

a total fat content of 35 to 45 % of which 5 to 15 % vegetable oil, 5 to 15 % milk fat and 20 to 30 % cocoa butter or cocoa butter replacers, 10 to 30 % water and

a total carbohydrates of 30 to 40 % of which 0 to 10 % invert sugar, 0 to 10 % non fat milk solids, in which about 50-80 % of the components come from chocolate and about 20-50 % from a water-in-oil emulsion containing the vegetable oil, the milk fat, the inverted sugar and the water and said emulsion comprising 0.5 to 2% of a low hydrophilic lipophilic balance emulsifier system comprising polyglycerolpolycricinoleate and monoglyceride.

Detailed description of the invention

5 [0008] In the context of the invention a coating composition is not limited to surface coating but also comprises using the coating in applications where alternate layers of ice confectionery and coating are made to create layered products. It may also be used to form solid pieces which may be used, for instance, in place of chocolate inclusions.

10 [0009] The ice confectionery product may be ice cream, iced milk, sherbet, sorbet, frozen yoghurt or frozen mousse. It may be more or less aerated. It may contain marbling, e.g. of sauce or inclusions.

15 [0010] Advantageously, the emulsifier of the pre-emulsion is a mixture of polyglycerol polycricinoleate (PGPR) and monoglyceride with a global hydrophilic lipophilic balance (HLB) of preferably < 3.

20 [0011] With respect to the water phase, cream may be preferably used.

25 [0012] Other ingredients may be present including sweeteners, flavorings or colorants, the proportions of which may be determined according to taste and/or appearance.

30 [0013] Cocoa solids non-fat which may come from cocoa liquor or cocoa powder may be used as flavorings.

35 [0014] With respect to the fat phase, a liquid vegetable oil such as e.g. sunflower, canola, soybean, peanut oil or any liquid oil at room temperature or any mix of these may be used. Milk fat or any fraction of it can also be used.

40 [0015] The coating composition may further contain crispy inclusions e.g. cereals, like expanded or toasted rice or dried fruit pieces which must be coated in moisture barriers to delay the absorption of moisture from the coating, which would result eventually in their sogginess.

45 [0016] The invention further relates to a method of production of a previously defined coating composition, which comprises separately mixing water, ingredients of the aqueous phase with the aroma and sweetening agents to make the aqueous phase, separately mixing a fat phase with the emulsifier at a temperature where

50 [0017] the fat is liquid and slowly introducing the aqueous phase into the fat phase while mixing to prepare an emulsion, and then further progressively mixing with molten chocolate.

[0016] The aqueous phase may preferably be pasteurized, e.g. in a high temperature short time (HTST) mix plant consisting of high shear mix tank, plate heating/cooling exchanger, holding tubes and optionally homogenizer. As an alternative the heat exchanger may comprise a shell and tube heating/cooling unit without homogenizer.

[0017] The coating composition is prepared by mixing the emulsifier in the molten fat at a temperature of 20 to 50° C, preferably between 30 and 40° C. Then the aqueous phase is separately warmed up to a temperature of 20 to 50° C, preferably between 30 and 40° C and progressively added to the fat phase under fine flow and agitation as a pre-emulsification step, thus forming a water-in-oil pre-emulsion.

[0018] To achieve a desired viscosity for application, the formed water-in-oil pre-emulsion is further sheared. This can be done either in batch with a U-shape stirring rod agitator at a higher speed, in a colloidal mill, or in continuous with a rotor/stator dispersing device or pumping the pre-emulsion through a static mixer with a high flow speed to form a fine emulsion. An in-line rotor/stator dispersing device or/and static mixer is preferred for a better consistency.

[0019] Chocolate is melted at about 40° C and lecithin is preferably added under mixing until homogeneous. The melted chocolate is then progressively added to the emulsion at about 40° C and mixed at low speed at 20 to 50° C, preferably between 30 and 40° C until homogeneous.

[0020] Preferably the final coating can be stored at a positive temperature of about 35°C under slow agitation until ready to use, preferably within 24 h. Alternately it can get solidified at about 20-22° C and kept refrigerated or frozen. It can be slowly melted and well mixed for reuse whilst recovering its initial properties.

[0021] The invention further relates to a method of coating a piece of frozen confectionery which comprises dipping the piece in a previously defined coating composition at a temperature of 28 to 40° C.

[0022] The setting time of such a coating is between 45 and 90 s.

[0023] The products obtained with this method have very good resistance to melting at about 20° C compared to products dipped in water-based coatings containing a pure aqueous phase which have a poor resistance to melting. In addition, water-based coatings need special equipment for subsequent cooling, sometimes at very low temperature to freeze the coating, which is not necessary with the present coating. In addition, the present coating, whilst still frozen, has a texture much softer than what is normally found in chocolate-based ice cream coatings, which typically shatter when bitten. At the same time, it does not have the apparent coldness of a sorbet or fruit juice type of coating. When bitten into it will deform but not crack, and will have a creamy texture. Also, by its soft and coherent nature, it will adhere to the piece and remain in place on the piece during con-

sumption and will not drip readily whilst melting.

[0024] There may also be other layers of coating inside or outside, e.g. of fudge or thin layer of crispy chocolate, giving a textural contrast.

5 [0025] The invention further relates to a method of moulding pieces of frozen confectionery, which comprises inserting in a mould a liquid coating and sucking back the excess liquid coating to form a shell, filling in the shell with ice cream, backing off with additional liquid coating, optionally inserting a stick and demoulding, e.g. by heating.

10 [0026] Ice cream pieces, portions, morsels, domes or cakes may also be coated using an enrober, in which the coating falls on the ice cream pieces while they are moving.

15 [0027] The invention is also related to the use of the coating composition to form a layer or an inclusion in an ice confectionery product.

20 [0028] In a first application of the coating, the coating composition is dropped onto a belt or band or into a mould followed by cooling to form solid pieces, e.g. drops of coating which can be used as inclusions in an ice confectionery product.

25 [0029] In a second application, the coating composition can be sprayed to form a layer on the surface of an ice confectionery product or layers inside an ice confectionery product to form a multilayered product.

30 [0030] In a further application of the coating composition, the liquid coating composition can be co-extruded with ice confectionery from a die to form a coating, a centre or ripple.

Examples

35 [0031] The following Examples further illustrate the present invention, in which percentages and parts are expressed by weight unless otherwise specified.

Example 1

40 [0032] An aqueous phase is prepared by mixing 22.4 kg fresh lactic cream containing 36 % fat, preheated at 50-55° C, 2.8 kg invert sugar preheated at 50-55° C, 1.4 kg skim milk powder and 1.4 kg water preheated at 50-55° C in a jacketed kettle maintained at 50-55° C. After pasteurization at 82 °C/25 s, the aqueous phase can be cooled to 4-6° C and stored until further use and then heated up in a plate heat exchanger to 40° C, or if used directly, brought to 40 ° C.

45 [0033] A fat phase is separately prepared by mixing 9 kg sunflower oil heated at 40° C, 2.28 kg anhydrous butter oil melted at 40° C and 0.3 kg PGPR and 0.42 kg distilled unsaturated monoglyceride melted at 40° C. The aqueous phase is progressively (fine flow) added 50 to the fat phase in a jacketed kettle with a U-shape stirring rod and mixed under high speed (about 70rpm), thus forming a water-in-oil pre-emulsion. The agitation is continued at the same speed for 20 min., and then the

agitation speed is decreased at about half the previous speed. The pre-emulsion is then transferred through a static mixer to form a fine emulsion.

In a separate kettle 59.7 kg of dark chocolate premelted at 40° C is mixed with 0.3 kg soya lecithin and the mixture is pumped into the final mixing tank containing the emulsion while mixing until homogeneous. The finished coating can be kept at about 35° C with slow agitation until ready for dipping ice cream bars.

[0034] Extruded ice cream stick bars with 80 % overrun at a temperature of about - 25° C are dipped into the above final coating at 35-40° C. After a certain time to allow the coating to set, the finished product is individually wrapped in flow packs and stored at - 18° C.

Example 2

[0035] The method of Example 1 is repeated for preparing a coating using milk chocolate instead of dark chocolate.

[0036] Extruded regular ice cream stick bars with 100% overrun are dipped into the thus prepared coating in the same way as in Example 1.

Example 3

[0037] Ice cream portions are prepared using an ice cream mix with 58.5 % water, 31.9 % solids non-fat, 9.6 % fat and 100 % overrun. The portions are then passed through a freezing tunnel and completely frozen at -22° C. Finally the portions are enrobed with the coating composition of Example 1 at 38° C. The portions obtained were adequately covered with a uniform layer of coating which stuck properly to the surface.

[0038] This method is also suitable for preparing bars and bite-size pieces.

Example 4

[0039] Cells of a stick machine in a brine tank of -38° C are filled with the coating of Example 2 at 35° C. After 10 s, excess coating composition is sucked-back and sorbet of 40 % overrun is deposited into the thus formed shells. After insertion of sticks and backing off with more coating at 35° C, the ice sticks are demoulded by heating at 12°C and flow-wrapped.

Claims

1. A water-containing composition for use with and coating of ice confectionery products which, by weight, comprises component ingredients which comprise:

a total fat content of 35 to 45% so that 5 to 15% is vegetable oil, 5 to 15% is milk fat and 20-30% is cocoa butter or a cocoa butter replacer or an-

alog;

10 to 30% water; and

a total carbohydrate content of 30 to 40% so that 0 to 10% is invert sugar and 0 to 10% is non-fat milk solids; and

in which about 50 to 80% of the component ingredients come from chocolate and about 20 to 50% of the component ingredients come from a water-in-oil emulsion comprising the vegetable oil, the milk fat, the invert sugar and the water and wherein the emulsion comprises from 0.5 to 2% of a low hydrophilic lipophilic balance emulsifier system comprising polyglycerolpolyricinoleate and a monoglyceride.

2. A composition according to claim 1 which comprises about 50 to 70% of the chocolate components and about 30 to 45% of the water-in-oil emulsion component.

3. A composition according to claim 1 which comprises about 60% by weight of the chocolate component ingredients and about 40% by weight of the water-in-oil emulsion component ingredients.

4. A composition according to claim 1 or 2 in which the emulsifier is a mixture of polyglycerolpolyricinoleate and unsaturated monoglyceride with a global hydrophilic lipophilic balance of preferably < 3.

5. A composition according to claim 1 which further comprises ingredients including sweeteners, flavorings and colorants.

6. A composition according to claim 1 in which the water phase of the emulsion predominantly contains lactic cream.

7. A method for production of a composition according to claim 1 or 2 which comprises a combination of aqueous and fat phases comprising mixing a fat with the emulsifier at a temperature so that the fat is liquid and introducing water which contains further component ingredients into the fat phase while mixing to prepare a water and fat phase emulsion, and then further progressively mixing molten chocolate into the emulsion.

8. A method according to claim 7 which comprises pasteurizing the water and further component ingredients in a high temperature/short time mix plant comprising a high shear mix tank, a heating/cooling exchanger, holding tubes and optionally a homogenizer.

9. A method for coating a piece of frozen confectionery with a composition according to claim 1 or 2 which comprises dipping the piece in the coating composition wherein the coating composition is at a temperature of 28 to 40°C. 5

10. A method for moulding pieces of frozen confectionery with a composition according to claim 1 or 2 which comprises inserting the liquid coating composition in a mould, sucking back excess liquid coating to form a shell in the mould, filling in the shell with ice confectionery, backing off with additional liquid coating, inserting a stick and demoulding. 10

11. A method which comprises co-extruding the composition according to claim 1 or 2 with ice cream from a die to form a coating, centre or ripple. 15

12. Use of the composition according to claim 1 to form a layer or an inclusion in a frozen dessert article. 20

13. Use of the composition according to claim 1 to enrobe ice cream pieces wherein the coating falls on the ice cream pieces while they are moving. 25

14. Use of a composition according to claim 1 in an ice confectionery product to provide the ice confectionery product with a good resistance to melting, good softness, well adherence to ice confectionery and improved flavor release. 30

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EUROPEAN SEARCH REPORT

Application Number
EP 99 20 1414

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
E	EP 0 986 959 A (NESTLE SA) 22 March 2000 (2000-03-22) * examples 1,3,8,11 * * claims 1-4,6,7 *	1-14	A23D7/00
A	WO 97 02754 A (LODERS CROKLAAN BV ;CAIN FREDERICK WILLIAM (NL); MANSON VAN DER ST) 30 January 1997 (1997-01-30) * page 1, line 5-12 * * page 2, line 32 - page 3, line 21 * * page 9, line 24-30 * * claims 1,4,6,7; examples 3-5 *	1,4,5,7, 9-14	
A	EP 0 401 427 A (LOTTE CO LTD) 12 December 1990 (1990-12-12) * column 2, line 52 - column 3, line 41 * * example 3 *	1-7	
A	PATENT ABSTRACTS OF JAPAN vol. 017, no. 052 (C-1022), 2 February 1993 (1993-02-02) & JP 04 262740 A (KANEKA FUCHI CHEM IND CO LTD), 18 September 1992 (1992-09-18) * abstract *	1-4	TECHNICAL FIELDS SEARCHED (Int.Cl.7)
A	US 4 808 334 A (EZAKI MITSUO ET AL) 28 February 1989 (1989-02-28) * column 1, line 18-23 * * column 1, line 48-67 * * column 2, line 55 - column 3, line 60 * * claim 1; example 1 *	1,4,7,8	A23D A23G
A	EP 0 393 327 A (LOTTE CO LTD) 24 October 1990 (1990-10-24) * column 2, line 31-45 * * column 3, line 3-32 * * column 5, line 19-24 * * example 1 *	1-5,7	
		-/-	
The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
THE HAGUE	9 June 2000	Rooney, K	
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the Invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			



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Application Number
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DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int.Cl.)						
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim							
A	EP 0 560 053 A (NESTLE SA) 15 September 1993 (1993-09-15) * claims 1,12; examples 2,3 *	1,13,14							
			TECHNICAL FIELDS SEARCHED (Int.Cl.)						
<p>The present search report has been drawn up for all claims</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Place of search</td> <td style="width: 33%;">Date of completion of the search</td> <td style="width: 34%;">Examiner</td> </tr> <tr> <td>THE HAGUE</td> <td>9 June 2000</td> <td>Rooney, K</td> </tr> </table>				Place of search	Date of completion of the search	Examiner	THE HAGUE	9 June 2000	Rooney, K
Place of search	Date of completion of the search	Examiner							
THE HAGUE	9 June 2000	Rooney, K							
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document							
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document									

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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09-06-2000

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
EP 0986959	A	22-03-2000	AU	4760399 A	23-03-2000
WO 9702754	A	30-01-1997	AU	6301196 A	10-02-1997
			EP	0837635 A	29-04-1998
			US	5958476 A	28-09-1999
EP 0401427	A	12-12-1990	JP	3010640 A	18-01-1991
			AU	616585 B	31-10-1991
			AU	4704489 A	13-12-1990
			DE	68907898 D	02-09-1993
			DE	68907898 T	24-02-1994
			KR	9515107 B	22-12-1995
JP 04262740	A	18-09-1992	NONE		
US 4808334	A	28-02-1989	NONE		
EP 0393327	A	24-10-1990	JP	2276537 A	13-11-1990
			JP	2514711 B	10-07-1996
			AU	626650 B	06-08-1992
			AU	5219690 A	18-10-1990
			DE	69008609 D	09-06-1994
			DE	69008609 T	01-09-1994
			KR	9705236 B	14-04-1997
			US	5160760 A	03-11-1992
EP 0560053	A	15-09-1993	US	5273763 A	28-12-1993
			AT	132701 T	15-01-1996
			AU	3300693 A	16-09-1993
			BR	9301104 A	26-10-1993
			CA	2089406 A	12-09-1993
			CN	1081324 A, B	02-02-1994
			DE	69301257 D	22-02-1996
			DE	69301257 T	23-05-1996
			DK	560053 T	22-04-1996
			ES	2082531 T	16-03-1996
			GR	3018949 T	31-05-1996
			MX	9300544 A	01-09-1993
			NZ	247088 A	27-02-1996
			ZA	9301147 A	14-09-1993